

## Part 1: Observing and Experimenting with GridWorld

### Do You Know?

#### Set 1

1. Does the bug always move to a new location? Explain.  
No. It will move only if there is not a Rock, Bug, Actor or Border in front of the it.
2. In which direction does the bug move?  
The bug move forward.
3. What does the bug do if it does not move?  
It will turn 45 degrees to the right until it can move.
4. What does a bug leave behind when it moves?  
A flower, whose color is the same as the bug.
5. What happens when the bug is at an edge of the grid? (Consider whether the bug is facing the edge as well as whether the bug is facing some other direction when answering this question.)  
If the bug can move forward, it will move forward directly, else it will truns 45 degrees to right until it can move.
6. What happens when a bug has a rock in the location immediately in front of it?  
It turns 45 degrees to the right.
7. Does a flower move?  
No.
8. What behavior does a flower have?  
The color of flowers is gradually darken until it turns to black.
9. Does a rock move or have any other behavior?  
No.
10. Can more than one actor (bug, flower, rock) be in the same location in the grid at the same time?  
No. A location has at most one actor at a time.

### Exercises

By clicking on a cell containing a bug, flower, or rock, do the following.

1. Test the `setDirection` method with the following inputs and complete the table, giving the compass direction each input represents.

Degrees	Compass Direction
0	North
45	Northeast
90	East
135	Southeast
180	South
225	Southwest

270	West
315	Northwest
360	North

2. Move a bug to a different location using the moveTo method. In which directions can you move it? How far can you move it? What happens if you try to move the bug outside the grid?

- (1) If there is no Rock, Bug, Actor or Border in front of the Bug, it can move.
- (2) It depends on the size of the window your set, anyway, the Bug can't move outside the grid.
- (3) If you try to move the bug out of grid, it will give a wrong message and stop the grid.

3. Change the color of a bug, a flower, and a rock. Which method did you use?

Use this method: setColor(java.awt.Color)

4. Move a rock on top of a bug and then move the rock again. What happened to the bug?

The bug will keep moving.